

NON-PUBLIC?: N  
ACCESSION #: 889200264  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: South Texas, Unit 1 PAGE: 1 OF 3

DOCKET NUMBER: 05000498

TITLE: Reactor Trip and Turbine Trip to Low Stator Cooling Water Flow  
EVENT DATE: 08/16/88 LER #: 88-048-00 REPORT DATE: 09/13/88

OTHER FACILITIES INVOLVED: DOCKET NO:

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION:  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Charles A. Ayala - Supervising Licensing Engineer

TELEPHONE: 512-972-8628

COMPONENT FAILURE DESCRIPTION:  
CAUSE: B SYSTEM: TJ COMPONENT: V MANUFACTURER: W120  
REPORTABLE NPRDS: No

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 1053 hours on August 16, 1988, with Unit 1 in Mode 1 (power operation) at 100 percent power, a reactor trip occurred as a result of a main turbine trip. The turbine trip was attributed to low stator cooling water flow, which resulted from failure of a discharge check valve to close when a pump was secured in preparation for preventive maintenance. The Auxiliary Feedwater System actuated on low steam generator level, which is normal for a trip from full power, and Main Feedwater isolated. Plant systems responded as designed, and operators stabilized the plant in accordance with approved procedures. Corrective actions included replacing the packing on the check valve and increasing the time delay for a turbine trip from low stator cooling water flow.

END OF ABSTRACT

DESCRIPTION OF OCCURRENCE:

At 1053 hours on August 16, 1988, with Unit 1 in Mode 1 (power operation) at 100 percent power, a reactor trip occurred as a result of a main turbine trip. The turbine trip was attributed to a low stator cooling water flow (differential pressure) actuation. The Auxiliary Feedwater System actuated approximately eight seconds after the reactor trip due to a low-low steam generator level, which is normal for a trip from full power. Approximately fourteen seconds after the reactor trip, a Main Feedwater isolation occurred on low Reactor Coolant System temperature (RCS T-ave). No other ESF actuations occurred. Operator and plant response to the turbine and reactor trip were normal. The plant was stabilized in accordance with applicable operating procedures by 1200 hours. The NRC was notified of the event at 1405 hours on August 16, 1988.

Subsequent investigation revealed that at approximately 1052 hours a plant operator (utility-non licensed) was removing Stator Cooling Water Pump No. 11 from service for scheduled preventive maintenance. He first started redundant Stator Cooling Water Pump No. 12 and allowed the system to stabilize, then secured Pump No. 11. Shortly after securing the pump, stator water low flow and very low flow alarms were received at the local panel, and a stator cooling water system trouble alarm was received in the main control room. The turbine and reactor trips followed very shortly thereafter.

The cause of the stator cooling water low flow condition was failure of the discharge check valve to close when Stator Cooling Water Pump No. 11 was secured. This allowed the output from the operating pump to backflow through the idle pump, resulting in a loss of system flow. This conclusion was reached after the Stator Cooling Water System turbine trip logic was verified to be correct and functioning as designed. Plant personnel then attempted to recreate the problem by starting Pump No. 11 and blocking the check valve open. Pump No. 12 was then started, the system stabilized and Pump No. 11 secured. This resulted in a trip of the turbine latch (the turbine was not in service during the troubleshooting activity) approximately five seconds later. It was also noted that the check valve was slow to return to its normal (closed) position when manually operated under zero pressure and flow conditions. This conclusion was further substantiated by a check of maintenance history which revealed that on March 17, 1988, the discharge check valve for Stator Cooling Water Pump No. 12 failed to close when the pump was secured. Investigation showed the packing to be old and dry on that occasion.

The suspect check valve was then disassembled and inspected for signs of binding or other abnormalities. No signs of binding were found, but the packing nut and gland packing were discovered to be old, dry and tight. The packing was replaced in accordance with vendor instructions, and the check valve was reassembled.

#### CAUSE OF OCCURRENCE:

The root cause of this event was failure of a stator cooling water pump discharge check valve to close, in combination with a short (5 second) time delay setting which did not allow time for the operator to take immediate corrective action. This resulted in a turbine trip and subsequent reactor trip.

#### ANALYSIS OF EVENT:

There were no adverse safety or radiological consequences as a result of this event. Safety systems functioned as designed, and plant operators and systems responded correctly.

Actuation of the Reactor Protection System is reportable pursuant to 10CFR50.73(a)(2)(iv).

#### CORRECTIVE ACTION:

The following actions have been taken to prevent recurrence of this event:

1. The Stator Cooling Water Pump discharge check valves were disassembled and inspected, and the packing was replaced.
2. The time delay for a turbine trip from stator cooling water low flow has been increased from 5 to 40 seconds which is below the generator manufacturer's design limit of 45 seconds. This allows time for an operator to take actions in case of check valve failure (e.g. restart the affected pump).

#### ADDITIONAL INFORMATION:

The check valve described in this report is a 6-inch check valve (Westinghouse part No. 705B466HO5).

There have been no previous reportable events associated with the Stator Cooling System.

ATTACHMENT 1 TO 8809200264 PAGE 1 OF 2

The Light  
company P.O. Box 1700 Houston, Texas 77001 228-9211  
Houston Lighting & Power

September 13, 1988  
ST-HL-AE-2783  
File No.: G26  
10CFR50.73

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

South Texas Project Electric Generating Station  
Unit 1  
Docket No. STN 50-498  
Licensee Event Report 88-048 Regarding a Reactor  
Trip and Turbine Trip Due to Low Stator Cooling Water Flow

Pursuant to 10CFR50.73, Houston Lighting & Power Company (HL&P)  
submits the attached Licensee Event Report (LER 88-048) regarding a  
reactor trip and turbine trip due to low stator cooling water flow.  
Plant safety systems performed as designed, and the event did not have  
any adverse impact on the health and safety of the public.

If you should have any questions on this matter, please contact Mr.  
C.A. Ayala at (512) 972-8628.

G.E. Vaughn  
Vice President  
Nuclear Plant Operations

GEV/RSS/nl

Attachment: LER 88-048

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Houston Lighting & Power Company

ST-HL-AE-2783  
File No.: G26  
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cc:

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